

NIKIFORUK, ANDREW

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IMPERIAL OIL LIMITED

Philip Sprung had the right
stuff at the right time—in the
wrong place <IOL CALGARY REFINERY>

By Andrew Nikiforuk with photography by Brian Milne



In March, the Sprung Environmental Space Enclosure (SESE), **left**, one of the most advanced vegetable-growing centres in the world, was closed down because something in the air was killing the plants. Philip Sprung, **above**, spent \$35 million developing the facility, which grew tomatoes and cucumbers from seedlings to maturity in 10 days.

The bad news arrived at the Sprung Environmental Space Enclosure a little before noon on March 11 of this year, in the form of an emergency fire-fighting crew and a hazardous-materials handling unit. Next came the owner himself—55-year-old Philip Davis Sprung Sr.—who joined Calgary fire chief Fred Parker and an occupational health officer in one of the enclosure's eight plastic-covered growing pods. The reek of gasoline fumes was almost overpowering: poisonous hydrocarbons, Sprung explained, had been leaking into the structure for months and had finally reached an almost lethal limit—150 parts per million (ppm) in some zones, enough to kill vegetation and sicken employees. Sprung's 8½ acres of cucumber and tomato plants had shrivelled and turned black; scores of his workers had quit, complaining of nausea, dizziness and listlessness. As the three men toured the vast facility, it became clear that Sprung's \$35 million space-age greenhouse, poised on the threshold of

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international recognition as one of the world's most advanced growing machines, would have to be shut down.

"I got a call from the Sprung people," Chief Parker said later. "They said they had explosive gases seeping into their buildings. I asked about ignition sources. They told me they had 500 gas furnaces on the property."

When the fire crews left, Sprung retired to his office, located in an old building near the CP Rail tracks, and began pacing the floor like an angry boxer—an apt analogy for a ruddy-faced man who stands 6 feet 3 inches tall and is known to his fellow Calgarians as "the Jolly Green Giant." He was not jolly now, however. The day's events and the stack of air-quality reports on his desk—one of which identified 190 different hydrocarbons that had leached into his greenhouse from the ground below—had finally proved to him the folly of trying to grow organic vegetables on top of a former Imperial Oil refinery site.

"God, have I got a story for you," he said, puffing on a cigarette. "The place just reeks of gasoline." He gulped some tea and resumed pacing. "These gases are carcinogenic!" Indeed, another report on his desk was a mass spectrometric test conducted by a University of Calgary biologist, Melvin Stroscher; it showed 100 ppm of benzene in the greenhouse air. Alberta's own occupational health standards state that 10 ppm of benzene is enough to carry the risk of cancer.

"It's walking dynamite," said Sprung.

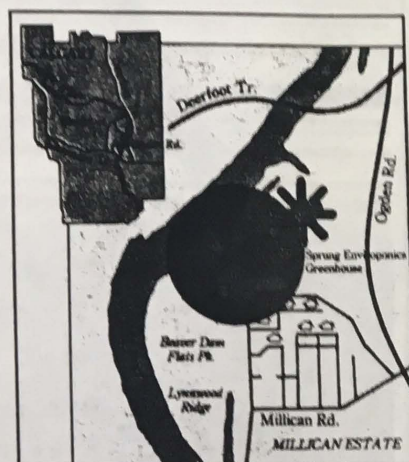
In the following weeks, Sprung's blackened cucumbers and scabrous tomatoes would make daily headlines in the Calgary newspapers. A residential community overlooking the greenhouse would learn that it, too, had been built on part of Imperial's abandoned tank farm. The city would reveal that Beaver Dam Flats Park, a children's recreational area on the east bank of the Bow River, was laced with 42,000 ppm of lead—42 times the permissible limit. Sprung, who leased the land from the City of Calgary in 1985, would claim that he was not shown vital engineering reports that clearly stated the land was unfit for "construction activities." Local residents would tell of being plagued by "gaslike fumes" for years. Former Imperial Oil employees would make anonymous telephone calls to reporters, recounting tales of massive diesel spills and toxic-sludge dumps. Experts would estimate a \$100 million cleanup bill, and the city, which

bought the land from Imperial in 1977, would set up two task forces: one to deal with the environmental disaster and another to deal with Sprung.

But on March 11, as he paced in the office he shared with the company's other three executives, Sprung had yet to engage in full battle. "Christ," he said, lighting another cigarette. "You'd think growing veggies would be a dull business."

Sprung's unique vegetable factory is, however, far from dull. Composed of eight pods—each 400 feet long and 38 feet high and large enough to house two hockey rinks—arranged around a central core like the spokes of an Indian medicine wheel, the Sprung Environmental Space Enclosure (called SESE by its 150 employees) looks like a Martian space colony, and it is no surprise to learn that Sprung's favourite television programme is *Star Trek*. The pods and core are covered by a translucent white fabric, invented by Sprung, that stretches over a network of supple aluminum girders like silk over the ribs of a giant umbrella. The spoked design, says Sprung, captures more light than conventional greenhouse designs and uses fewer trusses and beams—"about 50 percent fewer," he says. Moreover, the entire structure is airtight: all its oxygen is generated by the plants that grow within it. "The whole place makes an ordinary greenhouse look rather primitive," says Ian MacQuarrie, a plant biologist with the University of Prince Edward Island. "It's a big mother."

It is also a big producer. The growing takes (or rather, took) place within the eight pods, or "production zones," as Sprung calls them. The central core is a ring-shaped, 40,000-square-foot "preproduction zone" that nurtures thousands of seedlings. The central services are located at the hub of the ring, where technicians monitor computers, pumps, furnaces and other machines that sterilize and recycle water and air throughout the compound. The predominant colours are asylum white and tropical green. Workers wear white coveralls, white canvas shoes and sunglasses to shield their eyes from the intense, ski-slope brightness that diffuses through the pods' translucent skin. Visitors are sterilized at the entrance—given white coveralls and made to wash their hands and footwear in an antibacterial solution—before they are whisked through the central ring and into the production zones on white golf carts.



Built on an abandoned Imperial Oil refinery site on Calgary's Bow River, **above**, Sprung's 8½-acre space-age greenhouse is now dismantled, **right**. Neighbouring communities have also been affected. "You'd think," says Sprung, "that growing veggies would be a dull business."





Conventional greenhouses provide each cucumber plant with about eight square yards of growing space; Sprung packs three plants into that area. "We grow the same number of cucumbers per plant," says Dawn Sprung, Philip's eldest daughter and manager of the SESE operation. "But we have more plants, and we crop continuously. We don't have any down periods when nothing is growing." Plants are arranged in double rows: when the "alpha" row is ready to harvest, the "beta" row is just coming into production, and when the "alpha" row has peaked, production technicians discard the spent plants and bring in new ones from the preproduction zone. While conventional commercial greenhouse operators get no more than two crops in an eight-month growing season, Sprung harvests continuously, 12 months a year. The statistics are astounding: before the Calgary operation was shut down, Sprung was harvesting up to 19,000 cucumbers and 28,000 tomatoes per day within 7 to 10 days of flowering — three times the amount harvested from a conventional greenhouse of a comparable size and twice as fast. Total annual yields for cucumbers: 815,882 per acre, com-

pared with the Canadian greenhouse average of 252,000.

There are a few other technical surprises. Instead of soil, Sprung uses an ever-changing stream of liquid flowing along plastic troughs, or hydrocanals. Instead of sprinkler systems, condensation is allowed to build up in the hermetically sealed enclosure and precipitate in the form of rain on cucumbers and guests alike. Temperature, humidity and carbon-dioxide sensors dangle from the ceilings; connected to the hub's central computer, they allow the plants to exist in a perpetual vegetal paradise. Backup systems are built in: each of the eight production zones is heated not by several large industrial furnaces but by 47 small ones located along a narrow, 400-foot basement. "Even if 15 of them went down," says Dawn, "we could still maintain reasonable temperature parameters."

If Sprung's food-production facility is even half as good as he says it is, the implications are startling. So far, 47 different products have been grown in the structure, including red peppers, melons, strawberries, grapes, herbs and even fruit trees. Canada now imports about 60 percent of these goods at an annual cost to consumers of \$2

Before the shutdown, Sprung's plants grew in double rows along a vast network of hydrocanals, **above**, rather than in soil. Conventional greenhouses in Canada produce an average of 252,000 cucumbers per acre; Sprung's food-production facility yielded 815,882 per acre.

million. A large domestic greenhouse industry could keep most of those dollars working in Canada: Sprung believes that a coast-to-coast network of 200 SESEs – sold for \$13.5 million each as ready-made, turnkey operations – could change the way vegetables are grown, transported, stored and distributed in Canada. Instead of tasteless and expensive imports, Canadians – especially those in remote northern communities – could munch on home-grown organic produce at a fraction of the cost, 12 months a year. And year-round growing means year-round jobs for greenhouse employees – 30,000 of them in Sprung's envisioned network. "It seems to me," says MacQuarrie, "that Sprung has something very interesting for Canada. God only knows what the impact could be."

Perhaps as interesting as Sprung's horticultural results is the fact that he has achieved them without a degree in horticulture. "I can honestly boast that I have trouble growing dandelions," he says. In fact, no one on his staff has studied horticulture, biology or even gardening. "We are not horticulturists," says Dawn; "we're food-production managers." Sprung's training is in economics; he has a successful group of companies, a knack for lateral thinking and a lot of gall. Among Alberta's businessmen, he also has a reputation for controversy and pugnacity. "When people tell him something can't be done," observes Calgary entrepreneur Bob Black, "Sprung says, 'Bullshit. I'm going to do it.' No kidding, he's a driven man."

Sprung entered the greenhouse business almost by accident. The Sprung family has been making shelters of one kind or another since 1887, when Philip's paternal grandfather founded the Western Tent & Mattress Company. Although the firm has diversified in recent years into skiwear and sleeping bags, tents and awnings provided its mainstay until 1970, the year Sprung developed a modular substitute for the firm's biggest money-maker, the circus tent. Sprung did not like the way the old canvas-and-pole affairs responded to Prairie hail and wind, so he invented a sturdier model made of a synthetic fabric and portable aluminum arches that could be assembled or struck in a few hours. He called these Sprung Instant Structures, and they have virtually replaced their cumbersome predecessors around the world. They have also spread out into the wider field

of semi-nomadic shelter. Sprung Instant Structures have housed Quebec movie theatres, Middle East weddings, Texas trade shows and even the Kenyan army.

When these lightweight tents began to be used in more permanent locations, however, an interesting phenomenon was observed: weeds and

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grass grew in them, sometimes to waist height. Intrigued, Sprung conducted a few backyard experiments. He covered a row of wooden boxes with various modifications of the tent fabric, waited a couple of days and checked the results. Some seemed to have stopped plant growth, but one box, he says, "was really bunged up with plants." Sprung realized he had found a new market for his structures, and soon, a prototypical SESE was born. Sprung is profoundly secretive about his new fabric, which is protected by 18 patents and patent applications. "I don't want to tell everybody how I get the light," he says. "We diffuse it, refract it and magnify it. We have a material and a system that do it."

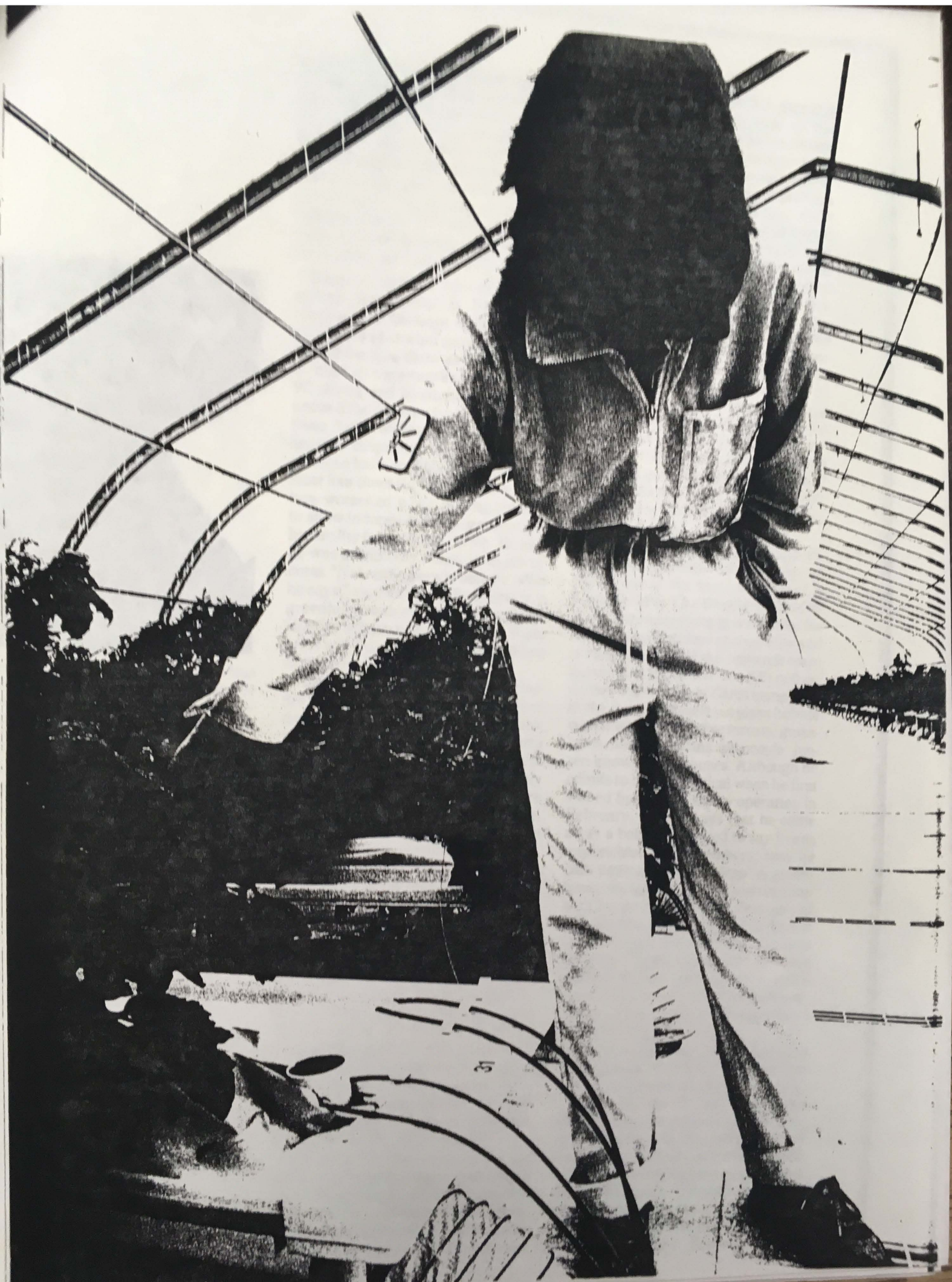
Having built his light-enhancing shell, Sprung did not want to fill it with conventional greenhouse technology, which he considered outmoded and inefficient. Ordinary greenhouses give vegetables shelter, he says, but they are drafty, archaically heated and ventilated hotels for a spectrum of plant pathogens. So when he opened his first experimental facility in 1981, Sprung opted for total environmental control – a hermetically sealed, plant-

growing universe in which air, humidity and temperature were completely monitored by computer. The plants, however, were grown in a mixture of soil, peat moss, sand and gravel and never achieved the kind of quality the Sprungs wanted. Disease, pests and salt buildup repeatedly interfered with their search for the perfect plant. The Sprungs began to look for a better way.

They found it in 1982. That year, Sprung approached Michael Anselm, a young British entrepreneur with Soil-Less Cultivation Systems Ltd., a firm working with the soil-less hydroponic Nutrient Film Technique (NFT). The system feeds plants by washing their roots in a constant stream of essential nutrients dissolved in sterilized water, which is returned to a large central reservoir by force of gravity and then pumped back into the hydrocanals. Using NFT, Anselm had consistently produced high yields, but he needed a larger environment in which to turn his system to greater advantage; Sprung offered him that environment. Anselm calls the resulting marriage of technologies "bio-photic soil-less engineering," which pairs a given amount of light with optimum growing conditions. "We are just giving the plants the ultimate in what they want," says Sprung.

Bio-photic soil-less engineering has allowed Sprung to do a lot of things conventional growers cannot do. By heating the substrate solution in the hydrocanals to 77 degrees F, for example, he can save energy costs by reducing the ambient air temperature from 64 to 57 degrees F. He can also adjust humidity and carbon-dioxide levels to match light levels, thereby enhancing growth by as much as 50 percent. Because uniform growing conditions can be maintained – there are no shadows in a SESE – uniform produce is guaranteed. Every facet of the operation is defined and controlled (staff even use rulers to calculate the best time to pick cucumbers), and every increment of growth can therefore be monitored and recorded. This is agriculture pushed to such a high level that it almost ceases to be agriculture. "When you identify all the environmental inputs and outputs," says Anselm, "you have an industrial process."

In the winter of 1983, with his new soil-less system in place under 2½ acres of light-enhancing fabric, Sprung hired a group of agriculture students from the Olds, Alberta, School of Agriculture to plant cucumbers. On De-





Benzene levels in the eight production zones soared to 100 ppm—10 times the amount needed to kill plants, **above**—before Sprung called in the fire department. "We are not horticulturists," says SESE manager Dawn Sprung, **left**, "we're food-production managers. No one here understands the horticultural lingo."

cember 15, the temperature outside the SESE was minus 40 degrees F, and conventional greenhouses were closed for the season. The entire crew told Sprung to jump in a snow drift. "They quit en masse," says Sprung. "They said, 'You can't grow cucumbers at this time of year.' " To Sprung, those were fighting words. "We went ahead and planted them ourselves, and we had cucumbers for Christmas dinner."

Relations with the agricultural community deteriorated in 1985, when Sprung set up his huge, eight-pod SESE complex and started growing cucumbers and selling them under the "Sante 7" label to supermarkets in Calgary, Winnipeg and Montreal. Consumers praised the produce for its fresh, crisp taste, but professional horticulturists became suspicious when Sprung announced his incredibly high yields—almost four times the norm per acre. Matters worsened when Sprung refused to allow independent researchers into his facility to verify his claims. He said he was afraid they would steal his secrets. "Not many people believe what he says," confides Jean-Paul Soucy, a greenhouse extension officer with the Quebec Ministry of Agriculture, Fisheries and Food. "Well, do *you* believe in miracles?"

The response from established growers was also negative: they simply condemned Sprung's project. An editorial in the newsletter of the Alberta Tree Nursery and Horticultural Centre, *Alberta Greenhouse Notes*, openly declared that Sprung's claims were "genetically impossible." John Wiebe, head of Alberta Agriculture's division of plant industry, observed that "good, knowledgeable, technically sound producers have never been able to achieve the yields claimed [by Sprung]." His economics were also attacked. Modern computer-controlled greenhouses in Holland are run for about \$550,000 per acre; Sprung's operation costs up to \$1.5 million an acre. Traditional greenhouses employ two people per acre; Sprung needs 18. As Leon Radder, market manager for the Ontario Greenhouse Vegetable Producers' Marketing Board, puts it, "There is no way, with the operation he is describing, with 150 people walking around in white lab coats, that he can make money."

The political dimensions of the debate surrounding Sprung's system were epitomized recently when the government of Prince Edward Island considered Sprung's proposal to build a facility near Summerside. Although two

experts called in by the P.E.I. planning committee—Ian MacQuarrie of the University of P.E.I. and Merle Jensen of the University of Arizona—were "very impressed" by Sprung's operation, local Maritime growers, perhaps fearing that Sprung's 8½-acre facility would kill their industry (it would nearly triple the current greenhouse acreage in Atlantic Canada), accused Sprung of "exaggerating the viability of the operation." In a series of letters to local members of parliament, the provincial premier and even the Prime Minister, members of the Greenhouse Growers Association of Nova Scotia strongly objected to the awarding of federal and provincial grants Sprung was seeking for the project. "If the project is as good as claimed by its promoters," the letters asked, "why do they need government funding of \$12 million?" As a result of the opposition, Sprung now says that the P.E.I. venture is "on hold."

Sprung, of course, has his supporters in the scientific community, of whom one of the most prominent is Merle Jensen. The 48-year-old professor has been studying greenhouses for 25 years in 35 different countries and is currently part of the research team developing Biosphere 2, a \$30 million domed microcosm of Earth being built in the Arizona desert—a glass bubble within which will thrive forests, grasslands, deserts, oceans and people. Jensen knows greenhouses. Although he admits to being skeptical when he first visited Sprung's Calgary operation in February, he also says that he came away a believer. "I used to say it was impossible," he remembers; now he calls SESE a "quantum leap" in greenhouse design. "I've never seen cucumbers hanging on plants in February at that latitude. What Sprung has done is taken the best of everything—the best structure, light refraction, growing method, plants—and come out with a system that is the most advanced anywhere in the world. I saw the plants, and they weren't plastic."

Jensen particularly admires Sprung's cooling system. Every summer and spring, conventional greenhouse growers vent out the air and, with it, the valuable growth-enhancing carbon dioxide. Not Sprung. His cooling method consists of eight miniature lakes lying outside the enclosure between each of the growing pods. "He cools the skin of the structure and the inside in a way that is not utilized in the business today," says Jensen. Because Sprung



does not need to open vents, the carbon-dioxide levels are kept constant and pure — no airborne diseases are able to enter the enclosures. "All of these little things add up to a super system."

And if imitation is the highest form of flattery, Sprung even has admirers in the greenhouse industry itself. In 1985, for example, three of his senior employees quit to join a rival firm, Hol-Simms, which billed itself as "a revolutionary new system of intensified farming." Hol-Simms's plan was to build greenhouses on top of a partially earth-bermed barn that would house 2,000 dairy cows; body heat and methane from manure would heat the familiar computer-controlled greenhouse above. The brainchild of a Calgary dentist and nurtured by a \$13.5 million federal grant, Hol-Simms went bankrupt shortly after the concrete foundation for the barn was laid.

At about the same time, Dominion Textiles (Domtex), the huge Montreal-based corporation, expressed interest in Sprung's enterprise. "They came in," claims Sprung, "under the pretense of diversifying into other fabrics, so we showed them the fabric for the food-growing system. They became interested and tried to zip us." Although the two companies came close to signing an agreement in June 1985, Domtex says they could not work out a mutually acceptable arrangement for the organization and control of the new food group. Domtex now has its own pilot greenhouse facility — complete with Nutrient Film Technique — which it calls Naturteck. Arthur Earl, Domtex's senior vice president, denies Sprung's accusations of industrial espionage. "We do not agree that he has a whole bunch of secrets; we can buy all of those things on the open market." But he does agree that Sprung "has made a world-scale contribution to greenhouse management."

Sprung also faces competition from Laval University's Centre for Sheltered Crop Specialization, located near Quebec City. Headed by professor of phytology André Gosselin, the centre has embarked on an aggressive research programme with the object of making Quebec "the Holland of North America." Modern technology like NFT

and cheap hydroelectric power from the James Bay megaproject make the dream possible, says Gosselin. Inexpensive electricity specifically allows growers to make use of supplemental lighting to maintain high yields in the winter and spring. Combining carbon-dioxide enrichment, NFT and artificial light from high-pressure sodium lamps, Gosselin has grown 200 cucumbers per square metre per year, nearly equalling Sprung's claims and doubling the yields currently achieved anywhere else in the world. "To me, it's the tech-

"We do not agree that he has a whole bunch of secrets," says Domtex vice president Arthur Earl. But Sprung has made "a world-scale contribution to greenhouse management."

nology of the future," he says and predicts that Quebec will be self-sufficient in vegetables and flowers by 1991, with or without Sprung: "There is no miracle to Sprung's technology."

Sprung, of course, has never claimed to be working miracles. The idea of producing food in huge plant factories has been around for decades. Researchers suspect that in the United States, vegetables have long been grown on military bases and in submarines in totally controlled environments with an eye toward self-sufficiency underground or in space, in the event of a nuclear holocaust. And food multinationals like Kraft, General Mills, Weyerhaeuser and General Electric have also dabbled with the concept with varying degrees of success. In Canada, one of the nation's largest food companies, John Labatt Limited, is working on a prototype similar to Sprung's in London, Ontario. "The technology is mature," says Ron Evans, the technical director of Labatt's Controlled Environment Research Project. "The only thing holding it back from significant large-scale development is economics and finding the right company with

the right commitment."

Sprung's achievement seems to be in removing the economic impediment. That may have been largely a question of scale. Evans says that one of the reasons multinational food megaprojects have not caught on yet has been that they are not cash-positive. He calculates that a 5-acre megaproject is not viable and that Sprung's 8½-acre facility may be the minimum acreage necessary to make a good profit. If Labatt and other food companies decide not to enter "the glamorous greenhouse business," says Evans, using NFT and computer-controlled environments, the reason will be economics. Small-scale growers agree; to many of them, bigger simply means more unwieldy. "The bigger the greenhouse," says Ron Voorberg, a greenhouse operator in the Holland Marsh area of Ontario, "the poorer it is run. We don't know why, but generally, it happens."

Sprung's enterprise is far from unwieldy: he feels that his is the right company with the right commitment. He also feels that, so far, he has not been in the right place.

When Sprung rented the Bow River site from the City of Calgary in the fall of 1985, he knew it had once been the home of an Imperial Oil refinery. His lease even specified that he would not be held responsible for the escape of vapours or oils impregnated in the land. "There was no question there was oil there," says Sprung, but he reasoned that crude oil was not going to evaporate and cause him problems. Diesel gas, however, was another matter. The city prepared the site with a \$70,000 surface cleanup, and more than half a dozen city departments — including plumbing, fire and health — all approved Sprung's building plans. "They said, 'Don't worry about a thing,'" says Sprung.

By the late fall of 1986, Sprung had a garden full of worries. Trees planted outside the complex had died, and a foul-smelling gas hovered around the structure. When oil started to spill into the Bow River from a sewer line on the site, a city pollution officer tried to lay a charge against Sprung. Staff turnover reached a startling 50 percent. And in November, a dramatic drop in production occurred.

In letters to the city and to Imperial Oil last January, Sprung spelled out the facts: when the ground around his structure froze and ice formed on the cooling ponds, hydrocarbons under the site forced their way into the facility

Plants in a SESE grow in double rows, left: when the "alpha" row has peaked, it is torn out and replaced while the "beta" row comes into full production. Up to 150 pickers, or "unit selectors," are kept busy 12 months a year.

and killed \$6 million worth of produce. Sprung wrote that he installed high-speed expulsion fans and drilled 500 wells to suck out the fumes, but the plants continued to blacken and die. He requested confidential assistance in order to avoid a "Star-Kist Tuna scandal right here in Calgary."

When neither the city nor the oil company responded satisfactorily to Sprung's pleas, he placed his call to fire chief Fred Parker. Although Imperial Oil now admits that it has quietly pumped out 4.8 million gallons of hydrocarbons from the site since 1970, it insists that its hydrocarbons did not kill Sprung's plants. So does the city. Brian Musgrove, Calgary's land director and head of the task force studying Sprung's predicament, suggests that Sprung's problem was a methane leak from gas lines into the facility or from an underground deposit of natural gas. Musgrove expresses "considerable doubt that the problem is hydrocarbon pollution." He also claims that Sprung excavated on the site to install basements for the structures "against the city's recommendations." Until an independent consultant either proves or disproves Sprung's story, the matter will remain unresolved, says Musgrove. (In the meantime, the city has given the residential community a clean bill of health and has started to get rid of the lead on the site.)

Sprung, however, has two reports from the University of Calgary's Kananaskis Centre of Environmental Research—an internationally recognized authority on air pollution—which contradict that city's and Imperial's claims. They state the fumes come from a "petroleum-based source." Roy Krouse, a university physicist who conducted chemical and isotopic analyses of the site, believes the gas did not come from city mains. "I'm absolutely certain of that," he insists. The Canadian Western Natural Gas Company has checked all its lines into Sprung's facility and reports that none of them are leaking. Musgrove is unimpressed by the evidence. "Although Sprung refers to various experts and reports," he says, "we have never seen any of them. He is a very secretive individual."

Faced with the prospect of endless political wrangling or a lengthy lawsuit (Calgary has been given notice of "potential liability" by Sprung's lawyers), Sprung has decided simply to pack up his tent and relocate to St. John's, Newfoundland. "We are businessmen," he says. "Call us opportunists if you like,

but we go where the opportunities are. We want to stay in business." On May 8, he signed an \$18.4 million joint venture with Newfoundland premier Brian Peckford. In exchange for a \$7 million loan guarantee and a \$3.5 million share purchase, the Newfoundland government now owns 50 percent of a project it believes will reduce the island's dependence on imported fruits and vegetables. Peckford calls the structure, which Sprung plans to have set up by July, "the most technologically advanced greenhouse system in the world." An ebullient Sprung believes that the potential for cheap electric power from Labrador combined with his growing technology could create a "garden of Eden" in the Atlantic region. The St. John's facility, which will receive 30 percent less light than the one in Calgary, will be equipped with \$3 million worth of high-pressure sodium lamps.

Sprung calculates that as many as 25 food-production facilities could be functioning today in North America had events treated him more kindly. Now, he says, he will be lucky to get two off the ground this year. He may build another structure in Calgary, if the city cooperates "on a nonlegal basis." Harold Brett, chairman of Bro Resources, the Toronto-based company that has lost its licence to build seests in six different provinces because it was unable to raise adequate financing, hopes to start work on one near Montreal's Mirabel Airport this year anyway. "What we need," he maintains, "is to get one up under real conditions to confirm the numbers Sprung has been talking about. Then the financing would be easy." As it is, he admits, "we're fighting an uphill battle."

Brett's enthusiasm and Newfoundland's welcome must seem to Sprung to be two warm fires in a cold, bleak landscape. He estimates he has lost \$10 million because of the Calgary disaster (he has removed his Sante 7 cucumbers from supermarket shelves), and his competitors feel they now have a time advantage. But Sprung takes some comfort from the words of Merle Jensen. "Nothing is impossible," muses Jensen. "Our only limits are how we think. That's the principle I go on. I think the biggest obstacles are economics and the conventional nature of man. They can be a bit unwieldy at times."

Philip Sprung can tell a story or two about that.



Plant technician Ian Chrysler, right, and other SESE staffers wore gas masks while dismantling the facility. With help from the Newfoundland government, Sprung plans to rebuild in St. John's and resume production of Sante 7 seedless English cucumbers, above, by this fall.

